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shortly after germination, the mycelium coming from the seed coat which is infected while still in the ovary. In sterile cultures there is a complete arrest of root development. It is concluded that the so-called soil preference of *Calluna* depends upon the maintenance of a biological balance between the roots and the root fungi. The disturbance of this balance in soils rich in lime is responsible for poor growth in such soils. Probably also the increased bacterial growth in the chalk cultures is detrimental. It is to be hoped that the author will make a comparative study of *Calluna* in its ordinary habitat, where the soil is acid and infertile.—H. C. COWLES.

A new *Tyloedendron*.—WEISS¹¹ has described a new form of *Tyloedendron* under the name *T. Cowardi*. Particular interest in this specimen centers around the secretory canals and primary wood. WEISS says: "The outer portions of the pith have very numerous secretory canals with dark brown contents, very like those found in the Medullasae, in cycads, and also in the pith of *Poroxylon*. These have not been observed or described, so far as I know, in any other specimens of *Tyloedendron* showing structure." There are also isolated groups of primary xylem at the periphery of the pith as in *Pitys antiqua*, but much smaller. Analogous structure is seen in *Mesopitys* of ZALESKY and in *Cycadeoidea* of WIELAND. With regard to the systematic position of this *Tyloedendron*, WEISS agrees with POTONIÉ that *Tyloedendron* is of araucarian affinity. He considers that the pitting of the secondary wood, the double leaf traces, etc., are araucarian or cordaitan in character, and homologizes the secretory ducts in the pith with those in the same region of the cone of *Araucaria* and the stem of *Poroxylon*. WEISS further considers that since a *Tyloedendron* has recently been described with discoid pith like the Cordaitae, considerable light is thrown on the connection between the cordaitan and the araucarian forms, and that the study of this genus promises much along this line in the future.—R. B. THOMSON.

Plant invasion on Hawaiian lava flows.—Thanks to the initiative of TREUB, we are now well informed as to the revegetation of Krakatau. The successive lava flows from Mauna Loa, the age of many of which is exactly known, afford an excellent opportunity for comparable investigations. The results of a preliminary study of this sort are given by FORBES.¹² As is well known, the lava here is of two well defined sorts, the *pahoehoe*, which has a smooth and satiny exterior and may be ropy, and the *aa*, which has a cavernous and jagged exterior. On a lava flow of 1859, no vascular plants were found on the *aa*, though the surface was often white with lichens. To FORBES' surprise,

¹¹ WEISS, F. E., A *Tyloedendron*-like fossil. Mem. Proc. Manchester Phil. Soc. 57: pp. 14. pls. 2. 1913.

¹² FORBES, C. N., Preliminary observations concerning the plant invasion on some of the lava flows of Mauna Loa, Hawaii. Occasional papers of the Bernice Pauahi Bishop Museum of Polynesian Ethnology and Natural History 5: 15-23. 1912.